220. Proposed by **L. ROBINSON, B. S.,** Philadelphia, Pa.

Find the sum of the first $n+1$ terms of the series

$$1+\frac{m}{1!}+\frac{m\,(m+1)}{2!}+\frac{m(m+1)(m+2)}{3!}+\ldots\ldots\ldots$$

Solution by **HEATON HEATON,** Atlantic, Iowa.

Writing $m+1$ for m, the series becomes

$$1+\frac{(m+1)}{1!}+\frac{(m+1)\,(m+2)}{2!}+\ldots\ldots+\frac{(m+1)(m+2)\ldots\ldots(m+n)}{n!}$$

$$=\frac{1}{1!}+\frac{2(m+1)}{2!}+\frac{3(m+1)\,(m+2)}{3!}+\ldots\ldots+\frac{n(m+1)(m+2)\ldots\ldots(m+n-1)}{n!}$$

$$+\frac{(m+1)(m+2)\ldots\ldots(m+n)}{n!}.$$

Transposing all the terms ot the second number but the last we obtain

$$1+\frac{m}{1!}+\frac{m\,(m+1)}{2!}+\ldots\ldots+\frac{m(m+1)\,(m+n-1)}{n!}=\frac{(m+1)(m+2)\ldots\ldots(m+n)}{n!}.$$

Also solved by Lloyd Holsinger, J. Scheffer, Grace M. Bareis, G. B. M. Zerr, L E. Dickson, G.W. Greenwood, F. P. Matz.

221. Proposed by **F. P. MATZ, Ph. D., Sc. D.**

Eliminate the unknowns from

$x/y+y/z+z/x=a$ ....(1), $x/z+y/x+z/y=b$ ....(2),

$(x/y+y/z)(y/z+z/x)(z/x+x/y)=c$ ....(3).

Solution by **GRACE M. BAREIS. A. B ,** Bala. Pa.

Substituting in (3) the values from (1) it becomes

$$(a-z/x)(a-x/y)(a-y/z)=c, \text{ or } a^3-(z/x+x/y+y/z)^2+(z/y+y/x+x/z)a-1=c,$$

whence $ab-1=c$ or $ab-c-1=0$.

Also solved by J. Scheffer, Lloyd Holsinger, Henry Heaton, M. E. Graber, L. E. Dickson, G. B. M. Zerr, G W. Greenwood, and the Proposer.

222. Proposed by **G. W. WALKER,** Camden, N. J.

Extract the square root of $87-12\sqrt{42}$.

Solution by **J. H. MEYER. S. J.,** Spring Hill College, Mobile, Ala.

Let $87-12\sqrt{42}=(\sqrt{\alpha}-\sqrt{\beta})^2$; then $\alpha+\beta=87$; $\alpha\beta=1512$; hence $\alpha=63$, $\beta=24$, and $\sqrt{\alpha}-\sqrt{\beta}=3\sqrt{7}-2\sqrt{6}$.

Also solved by Henry Heaton, Lloyd Holsinger, J. J. Keyes, M. E. Graber, L. E. Dickson, S. F. Norris, J. Scheffer, Grace M. Bareis, G. B. M. Zerr, G. W. Greenwood, L. S. Shively, and F. P. Matz.